# How to / Trackmania / Mediatracker / Custom camera

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## Chapter 6 : Moving from Key to Key

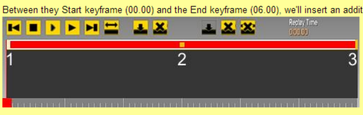
Until now it was pretty easy, because we just a Start keyframe and an End Keyframe. Now we'll take care of the camera movement if you have multiple frames, which the camera must pass.

### Preperations

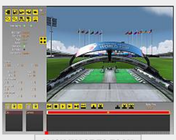
This time you should be sure that you recorded a Mediatracker Ghost, which doesn't take more than 6.00 seconds from Start to Finish (at least not a lot more)...Record a new one, if necessary.

Delete your old Block and insert a new one at 0:00.00 .. Set the "Block End" to 0:06.00 again and also activate "Keep on Playing", just like in the previous block...

Between they Start keyframe (00.00) and the End keyframe (06.00), we'll insert an additional keyframe at 03.00.




Look at the different keyframes. Ensure, that "**Anchor**" and "**Target**" are **not selected**.



CLICK IMAGE TO ZOOM

### (1) Start keyframe (00.00)

We'll face the Car from the front this time.

Please ensure that you use the same precise values as in the picture, you best enter them by hand.

CLICK IMAGE TO ZOOM

### (2) 2nd keyframe (03.00)

The camera just moves backwards, until it sits directly on the top of the pole.

Please ensure that you use the same precise values as in the picture, you best enter them by hand.

CLICK IMAGE TO ZOOM

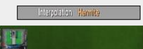
### (3) End keyframe (06.00)

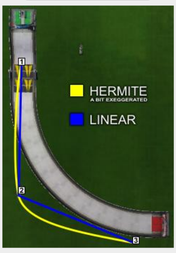
From the pole, the camera now moves to the right until the finish is visible in the lower right corner...

Please ensure that you use the same precise values as in the picture, you best enter them by hand.

### Interpolation : Simple explanation

It's clear the camera will **move** from Start keyframe -> 2nd keyframe -> End keyframe.
But there are **different ways** the camera can do this ...




This option handles camera movements between keyframes.

**Interpolation: Hermite (default)**
Hermite will smoothen out the camera's path between all keyframes, so the moves will always seem like one fluid motion.

**Interpolation: Linear**
Linear will make the camera move in a straight forward way, from point to point, no smoothening.

**Interpolation: None**
No movement between keyframes at all is beeing made. Good for snapshot / standstill camera effects..

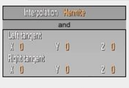
**Interpolation: FixedTangent**
This is not simple stuff, see the next chapter for a detailed explanation. If you don't care for mathematical details, forget about it now.

Now you can try the different Interpolation method in our test track, just to see how it looks like. Just don't forget to use the same Interpolation method for all keyframes !

### Interpolation : Detailed explanation

CLICK IMAGE TO ZOOM

**Hermite**
Although this method is very convenient to use, there's something special about it:
The curvy movement of the camera is not only calculated out of 2 consecutive keyframes, but all keyframes in the block.




In mathematical ways, the curvy movements are described by Tangents (the blue arrows).

The "Hermite" function will **calculate all Tangents** between all frames (red squares) in a camera block **automatically**, so everything will be smooth.

When playing your clip, you will often see the Tangent values change, automatically beeing calulcated by "Hermite", so you can't edit them manually.

**Warning**: include_once(/www/htdocs/w0096a91/inc/content_google_250-250-2-floatright.php) [function.include-once]: failed to open stream: No such file or directory in **/www/htdocs/w0096a91/howto/tm_mediatracker_camera_custom/index-eng-4.php** on line **194**

**Warning**: include_once() [function.include]: Failed opening '/www/htdocs/w0096a91/inc/content_google_250-250-2-floatright.php' for inclusion (include_path='../usr/share/php:..') in **/www/htdocs/w0096a91/howto/tm_mediatracker_camera_custom/index-eng-4.php** on line **194**

**Drawback**
It's biggest strength is its biggest weakness:
Because all tangents are automatically calculated, that also means that, changing 1 keyframe's camera position will automatically affect all other keyframes as well.

**Example**
You have a camera flight in the Intro, letting the camera pass various really narrow locations, setting lots of different keyframes, so the camera doesn't fly through any objects.
Now you insert just another keyframe further away and just because all values are recalculated, the curvy movement will make the camera now go through several objects. And now what?

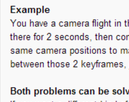
**It gets worse**
And that also means, that there will be curvy movement between 2 keyframes, even if the positions are the same in both keyframes (look at the Tangent picture, 3rd and 4th red squares).

**Example**
You have a camera flight in the Intro, nice and smooth. At a certain spot you want to make the camera stop, stay there for 2 seconds, then continue it's smooth flight. Most probably you'd insert 2 additional keyframes with the same camera positions to make the camera stay there... do you really believe there will be no curvy movement between those 2 keyframes, just because the camera position is the same ???

**Both problems can be solved**
If you want a different kind of action, use different blocks! As soon as you think that the "Hermite" automated calculation will cause you trouble, just quit the current Camera Block and insert a new one directly afterwards.

Then copy the position values from the End keyframe of the last block to the 1st keyframe of the new block and you will have a seamless transition between both.

### Fixed Tangent




In opposite to the "Hermite" function, "FixedTangent" will let you **define all Tangents manually!** Keyframe by Keyframe... What a joy! Praise the lord !
As you've seen in the Tangent picture (Hermite), every Tangent leaves its keyframe towards 2 directions, with different attributes.

That's exactly what is meant by "**Left tangent**" and "**Right tangent**". The "Left tangent" values point towards the previous keyframe, the "Right tangent" values point towards the next keyframe in the timeline...

X/Y/Z should be clear by now.. you can experiment a bit, I won't explain it in detail...

**Pro**
You can define every single detail of how the camera should move. This way you also won't suffer the drawbacks of automatic calculation, as described for the "Hermite" function.

**Contra**
You won't live long enough to finish your work. Although this function is really powerful, it's a complete waste of time, because you'll never need this much detail.

### So we've come to the end of this tutorial.

My final recommendation is, that you experiment a lot with cameras, there are lots of cool effects that can be obtained by a sophisticated camera useage.

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